Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A signal processing system, for interfacing telephony devices with packet-based networks, the system comprising:

a voice exchange for exchanging voice signals between a network line and a packet based network; and

a full duplex data exchange for exchanging data signals from the network line with data signals from the packet based network, wherein the full duplex data exchange demodulates the data signals from the network line, outputs the demodulated data signals to the packet based network, remodulates the demodulated data signals from the packet based network, and outputs the remodulated data signals to the network line~~, and wherein the full duplex data exchange includes a rate synchronizer for receiving data rate codes from the packet based network and setting a data rate of a telephony device coupled to the network line in response to the received data rate codes~~.

Claim 2 (Canceled).

3. (Previously Presented) The signal processing system of claim 1 wherein the data signals from the network line are modulated by a voiceband carrier, and the data exchange comprises a data pump for demodulating the data signals from the network line for transmission on the packet based network and remodulating the data signals from the packet based network with the voiceband carrier for transmission on the network line.

4. (Previously Presented) The signal processing system of claim 3 wherein the data exchange comprises a jitter buffer for receiving packets of the data signals of varying delay from the packet based network and compensating for the delay variation of the data signal packets.

5. (Original) The signal processing system of claim 4 wherein the jitter buffer outputs an isochronous stream of the received data signals.

6. (Original) The signal processing system of claim 4 wherein the data pump transmits the received data signals to the network line at a transmit rate.

7. (Original) The signal processing system of claim 6 wherein the jitter buffer compensates for the delay variation of the data signal packets by holding a number of the received data signals, and wherein the data exchange further comprises a clock synchronizer which adaptively adjusts the transmit rate of the data pump in response the number of the received data signals in the jitter buffer.

8. (Original) The signal processing system of claim 6 wherein the jitter buffer compensates for the delay variation of the data signal packets by holding a number of the received data signals, and wherein the data exchange further comprises spoof logic which provides spoof data to the data pump when the number of the received data signals held in the jitter buffer is below a threshold.

9. (Previously Presented) The signal processing system of claim 1 wherein the voice exchange comprises a jitter buffer for receiving packets of the voice signals of varying delay from the packet based network and compensating for the delay variation of the voice signal packets.

10. (Original) The signal processing system of claim 9 wherein the jitter buffer outputs an isochronous stream of the received voice signals.

11. (Original) The signal processing system of claim 9 wherein the jitter buffer comprises a voice queue which buffers the received voice signals for a holding time, and a voice synchronizer which adaptively adjusts the holding time of the voice queue.

12. (Previously Presented) The signal processing system of claim 11 further comprising a tone exchange for exchanging DTMF signals between the network line and the packet based network, the DTMF exchange comprising a DTMF queue for buffering packets of the DTMF signals from the packet based network, and a tone generator which generates a DTMF tone responsive to the buffered DTMF signals, the DTMF queue outputting a signal to the voice synchronizer to suppress the buffered voice signals when the DTMF signals are in the DTMF queue.

Claims 13 - 25 (Canceled).

26. (Currently Amended) A signal processing system, comprising:

a voice exchange for exchanging voice signals between a first telephony device and a packet based network;

a full duplex data exchange for exchanging data signals from a second telephony device with demodulated data signals from the packet based network, wherein the full duplex data exchange demodulates the data signals from the first telephony device, outputs the demodulated data signals to the packet based network, remodulates the demodulated data signals from the packet based network, and outputs the remodulated data signals to the first telephony device; and

a call discriminator~~, for discriminating between the voice signals and the data signals by detecting presence of a predetermined tone, and~~ for selectively enabling at least one of the voice exchange and the data exchange.

Claims 27 - 37 (Canceled).

38. (Previously Presented) The signal processing system of claim 26 wherein the voice exchange comprises a voice decoder for decoding packets of the voice signals from the packet based network for transmission to the first telephony device, a voice activity detector which detects the voice signals without speech, and a comfort noise generator which inserts comfort noise in place of the voice signals without speech.

39. (Original) The signal processing system of claim 38 wherein the voice exchange further comprises a comfort noise estimator which generates comfort noise parameters from at least a portion of the voice signals without speech, the comfort noise generator being responsive to the comfort noise parameters.

40. (Previously Presented) The signal processing system of claim 26 wherein the voice exchange comprises a voice decoder for decoding packets of the voice signals from the packet based network for transmission to the first telephony device, a voice activity detector which detects lost voice signals, and a lost packet recovery engine which processes the voice signals to compensate for the lost voice signals.

41. (Previously Presented) The signal processing system of claim 26 wherein the voice exchange comprises a voice encoder for encoding the voice signals from the first telephony device for transmission on the packet based network, and a voice activity detector which suppresses the voice signals without speech.

42. (Original) The signal processing system of claim 41 wherein the voice exchange further comprises a comfort noise

estimator which generates comfort noise parameters when the voice activity detector suppresses the voice signals without speech.

43. (Previously Presented) The signal processing system of claim 26 wherein the voice exchange further comprises a decoder for decoding packets of the voice signals from the packet based network, and an echo canceller for canceling decoded voice signal echoes on incoming voice signals from the first telephony device.

44. (Original) The signal processing system of claim 43 wherein the voice exchange further comprises a non-linear processor which mutes the incoming voice signals when the incoming voice signals do not comprise speech and the echo canceller detects the decoded voice signals with speech.

45. (Previously Presented) The signal processing system of claim 26 wherein the voice exchange comprises a voice encoder for encoding the voice signals from the first telephony device into voice signal packets for the packet based network.

46. (Previously Presented) The signal processing system of claim 45 further comprising a tone exchange comprising a DTMF

detector for detecting a DTMF signal from the first telephony device and generating a DTMF packet for the packet based network in response to the DTMF signal, the DTMF detector muting the voice signal packets when a DTMF signal is detected.

47. (Previously Presented) The signal processing system of claim 26 further comprising a fax exchange for exchanging fax signals from a third telephony device with demodulated fax signals from the packet based network, wherein the call discriminator selectively enables the fax exchange.

48. (Previously Presented) The signal processing system of claim 47 wherein the fax signals from the third telephony device are modulated by a voiceband carrier, and the fax exchange comprises a data pump for demodulating the fax signals from the third telephony device for transmission on the packet based network, and remodulating the demodulated fax signals from the packet based network with the voiceband carrier for transmission to the third telephony.

49. (Currently Amended) A method of processing signals, comprising:

exchanging voice signals between a network line and a packet based network;

demodulating data signals from the network line for inputting to the packet based network;

remodulating the demodulated data signals from the packet based network for inputting to the network line; and

simultaneously exchanging the remodulated data signals from the network line with demodulated data signals from the packet based network~~;~~

~~receiving data rate codes from the packet based network; and~~

~~setting a data rate of a telephony device coupled to the network line in response to the received data rate codes~~.

Claims 50 - 73 (Canceled).

74. (Currently Amended) A method of processing signals, comprising:

exchanging voice signals between a first telephony device and a packet based network;

demodulating data signals from the first telephony device for inputting to the packet based network;

remodulating the demodulated data signals from the packet based network;

simultaneously exchanging the remodulated data signals from a second telephony device with demodulated data signals from the packet based network; and

discriminating between the voice signals and the data signals~~, by detecting presence of a predetermined tone,~~ and invoking at least one of the voice exchange and the data exchange based on said discrimination.

Claims 75 - 90 (Canceled).

91. (Previously Presented) The method of claim 74 further comprising:

exchanging fax signals from a third telephony device with demodulated fax signals from the packet based network, wherein the discriminating comprises selectively invoking the fax exchange, and wherein the fax signals from the third telephony device are modulated by a voiceband carrier, and the fax exchange comprises a data pump for demodulating the fax signals from the third telephony device for transmission on the packet based network, and remodulating the fax signals from the packet based network with the voiceband carrier for transmission to the third telephony device.

Claims 92 - 94 (Canceled).

Claims 95 - 174 (Canceled).

175. (New) A method for interfacing a plurality of telephony devices with a packet based network, the packet based network adapted for transmission of packetized signals, the method comprising:

depacketizing an incoming packetized signal from the packet based network;

identifying the depacketized signal as a voice signal, a fax signal, or a data signal;

if the depacketized signal is a voice signal, performing a voice mode signal processing on the voice signal;

if the depacketized signal is a fax signal, performing a fax relay mode signal processing;

if the depacketized signal is a data signal, performing a data modem relay mode signal processing; and

transmitting the depacketized processed signal to a corresponding type of telephony device of the plurality of telephony devices.

176. (New) The method of claim 175, wherein the plurality of telephony devices include one or more of analog and

digital telephones, ethernet telephones, internet protocol telephones, analog fax machines, data modems, cable modems, interactive voice response systems, and private branch exchange systems.

177. (New) The method of claim 175, wherein the packet based network is the internet.

178. (New) A method for integrated interfacing a plurality of telephony devices to a packet based network, the packet based network adapted for transmission of packetized signals, the method comprising:

packetizing a voice signal, a fax signal, or a data signal in a packetiziation engine to generate a packetized signal; and

transmitting the packetized signal over the packet based network to a far end telephony device.